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EXAMINER	
TORRES, JOSEPH D	

ART UNIT	PAPER NUMBER
2133	

DATE MAILED: 05/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/973,792	BERKOVICH, EFRAIM	
	Examiner	Art Unit	
	Joseph D. Torres	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *13 and 14* is/are allowed.

6)☒ Claim(s) *1-12 and 15-26* is/are rejected.

7)☒ Claim(s) *6,7,19 and 20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on 28 April 2004. These drawings are accepted.

Specification

2. In view of Amendment A in Paper No. 4, the Examiner withdraws all objections to the specification.

Claim Rejections - 35 USC § 112

3. In view of the Applicant's arguments in Amendment A of Paper No. 4, the Examiner withdraws all 35 USC § 112 rejections of the previous Office Action.

Response to Arguments

4. Applicant's arguments with respect to claims 1-12 and 15-20 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-12 and 15-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "said combined hash indices" in lines 6 and 7. There is insufficient antecedent basis for this limitation in the claim. Note: line 5 of claim 1 was amended to read, "pairwise combined hash indices". Lines 8 and 7 should also be updated to reflect these changes. The Examiner suggests replacing "said combined hash indices" with --said pairwise combined hash indices--.

Claims 8 and 15 recite similar language as in claim 1.

Claims 2-7, 9-12 and 15-26 depend from respective claims 1, 8 and 15.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 8, 15 and 21-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Arnold; Richard F. et al. (US 4564944 A, hereafter referred to as Arnold).

35 U.S.C. 102(b) rejection of claims 1 and 15.

Arnold teaches a data dictionary (Multiple Hashing Table in Figure 1 of Arnold is a data dictionary) comprising: an inverse fault-tolerant decoder implemented for an error

correction code (Note: decoding substantially performs the inverse of encoding since decoding extracts data from originally encoded data and hence is substantially the inverse of encoding; in addition, the Decoder in Figure 1 of Arnold is designed to perform the inverse operation of decoding in order to retrieve fault-tolerant data hence is an inverse fault-tolerant decoder) configured to transform a data vector into a plurality of predetermined index values (the data vector on line 128 in Figures 1 and 3A in Arnold are transformed into syndrome values; Claim 4 in Arnold teaches that each syndrome is used as an address for a lookup table, that is, a syndrome is also a predetermined index value pointing to a specific location in a lookup table, hence Arnold teaches that the data vector on line 128 in Figures 1 and 3A is transformed into a plurality of predetermined syndrome index values); combinational logic configured to combine pairs of said index values to form corresponding pairwise combined hash indices (Figure 4 in Arnold teaches that the predetermined syndrome index values are combined using AND, OR and XOR combinational logic to form corresponding hash indices HF1-HF3; Col. 9, lines 38-43 in Arnold teach that HF1 is formed by logically combining the pair A1 and A2 to produce a pairwise result and then logically combining the pair A3 and the previously produced pairwise result to produce the pairwise combined hash index HF1; Note: HF2 and HF3 in Figure 4 are similarly formed using pairwise logical combinational operations indicated by the parenthesis in Figure 4 to produce pairwise combined results); and data storage configured as a hash table referencing indexed data corresponding to said combined hash indices (ROS 53, 55 and 57 in Figure 3A are data

storage configured as a hash table referencing indexed data corresponding to said combined hash indices HF1-HF3).

35 U.S.C. 102(b) rejection of claim 8.

Arnold teaches a method of accessing a dictionary (Multiple Hashing Table in Figures 1 and 3 of Arnold clearly teach a method of accessing a dictionary) comprising the steps of: transforming a data vector into a plurality of predetermined index values (the data vector on line 128 in Figures 1 and 3A in Arnold are transformed into syndrome values; Claim 4 in Arnold teaches that each syndrome is used as an address for a lookup table, that is, a syndrome is also a predetermined index value pointing to a specific location in a lookup table, hence Arnold teaches that the data vector on line 128 in Figures 1 and 3A is transformed into a plurality of predetermined syndrome index values); combining pairs of said index values to form corresponding pairwise combined hash indices (Figure 4 in Arnold teaches that the predetermined syndrome index values are combined using AND, OR and XOR combinational logic to form corresponding hash indices HF1-HF3; Col. 9, lines 38-43 in Arnold teach that HF1 is formed by logically combining the pair A1 and A2 to produce a pairwise result and then logically combining the pair A3 and the previously produced pairwise result to produce the pairwise combined hash index HF1; Note: HF2 and HF3 in Figure 4 are similarly formed using pairwise logical combinational operations indicated by the parenthesis in Figure 4 to produce pairwise combined results); and referencing indexed data stored in a hash table corresponding to said combined hash indices (ROS 53, 55 and 57 in Figure 3A

are data storage configured as a hash table referencing indexed data corresponding to said combined hash indices HF1-HF3).

35 U.S.C. 102(b) rejection of claims 21, 23 and 25.

Col. 9, lines 38-43 in Arnold teach that HF1 is formed by logically combining the pair A1 and A2 to produce a pairwise result and then logically combining the pair A3 and the previously produced pairwise result to produce the pairwise combined hash index HF1. Note: The pairwise combinational operations are performed in lexicographical order of the indices of for A1-A3. HF2 and HF3 are formed similarly (see Figure 4 in Arnold).

35 U.S.C. 102(b) rejection of claims 22, 24 and 26.

Col. 9, lines 38-43 in Arnold teach that HF1 is formed by logically combining the pair A1 and A2 to produce a pairwise result and then logically combining the pair A3 and the previously produced pairwise result to produce the pairwise combined hash index HF1. Note: The pairwise combinational operations are performed in lexicographical order of the indices of for A1-A3. HF2 and HF3 are formed similarly (see Figure 4 in Arnold). Note: HF1 is a concatenated string of logical operations and operands A1-A3 whereby the operands A1-A3 are concatenated in lexicographical order.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims 2-5, 9-12 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arnold; Richard F. et al. (US 4564944 A, hereafter referred to as Arnold) in view of Berkovich et al. (Berkovich, S., El-Qawasmeh, E., "Reversing the Error-Correction Scheme for a Fault-Tolerant Indexing, " The Computer Journal, vol. 43, no. 1, pp. 54 - 64, January 2000).

35 U.S.C. 103(a) rejection of claims 2, 9 and 16.

Arnold substantially teaches the claimed invention described in claims 1, 8 and 15 (as rejected above).

However Arnold does not explicitly teach the specific use of bit-attribute data.

Berkovich et al. (hereafter referred to as Berkovich), in an analogous art, teaches that the data vectors used in an inverse fault-tolerant decoder are comprised of bit-attribute data (see col. 1, page 1 of Berkovich). The Examiner asserts that Arnold teaches an inverse fault-tolerant decoder for digital data and Berkovich teaches an inverse fault-

tolerant decoder for a specific type of digital data comprising bit-attribute data. One of ordinary skill in the art at the time the invention was made would have recognized that the digital data comprising bit-attribute data in Berkovich is digital data that the inverse fault-tolerant decoder in Arnold was designed to decode.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Arnold with the teachings of Berkovich by using the fault-tolerant decoder in Arnold on a type of digital data for which it was designed such as bit-attribute data. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that using the fault-tolerant decoder in Arnold on a type of digital data for which it was designed such as bit-attribute data would have provided a fault-tolerant environment for a specific type of data for which the fault-tolerant decoder in Arnold was designed.

35 U.S.C. 103(a) rejection of claims 3, 4, 10, 11 and 17.

Col. 2 on page 6 of Berkovich teaches a Golay [23,12,7] code; Note: paragraph [0097] on page 32 of the Applicant's specification teaches that a Golay [23,12,7] code is an example of an inverse error correction code hence a decoder for decoding a Golay [23,12,7] code is an inverse fault-tolerant decoder.

35 U.S.C. 103(a) rejection of claims 5, 12 and 18.

Each of the buckets of a Golay code of Hamming distance 2 comprise border vector types of hamming distance 2 located at a border of a decoding sphere and non-border vector types of Hamming distance less than 2 located interior to said decoding sphere.

Allowable Subject Matter

8. Claims 13 and 14 are allowed.

9. Claims 6, 7, 19 and 20 are objected to as being dependent upon rejected base claims, but would be allowable if rewritten in independent form including all of the limitations of the respective base claims and any intervening claims and if the Applicant were to correct the 35 USC § 112 error as suggested, above.

The following is an Examiner's statement of reasons for allowance and the indication of allowable subject matter:

The present invention pertains to A method of accessing a dictionary comprising the steps of: transforming a data vector into a plurality of predetermined index values; combining pairs of said index values to form corresponding combined hash indices; and referencing indexed data stored in a hash table corresponding to said combined hash indices.

Claim 13 recites various features:

"(i) identifying said data vector as a border vector type, (ii) defining an offset of said data vector from a center of a decoding sphere of an error-correction code implemented by

said inverse fault-tolerant decoder, and (iii) identifying all possible offsets from adjacent decoding spheres of said error-correction code until said combinations fill in all bit positions corresponding to said data vector such that centers of said adjacent decoding spheres correspond to said index values".

The Prior Art of record and in particular Arnold teaches a method of accessing a dictionary (Multiple Hashing Table in Figures 1 and 3 of Arnold clearly teach a method of accessing a dictionary) comprising the steps of: transforming a data vector into a plurality of predetermined index values (the data vector on line 128 in Figures 1 and 3A in Arnold are transformed into syndrome values; Claim 4 in Arnold teaches that each syndrome is used as an address for a lookup table, that is, a syndrome is also a predetermined index value pointing to a specific location in a lookup table, hence Arnold teaches that the data vector on line 128 in Figures 1 and 3A is transformed into a plurality of predetermined syndrome index values); combining pairs of said index values to form corresponding pairwise combined hash indices (Figure 4 in Arnold teaches that the predetermined syndrome index values are combined using AND, OR and XOR combinational logic to form corresponding hash indices HF1-HF3; Col. 9, lines 38-43 in Arnold teach that HF1 is formed by logically combining the pair A1 and A2 to produce a pairwise result and then logically combining the pair A3 and the previously produced pairwise result to produce the pairwise combined hash index HF1; Note: HF2 and HF3 in Figure 4 are similarly formed using pairwise logical combinational operations indicated by the parenthesis in Figure 4 to produce pairwise combined results); and referencing indexed data stored in a hash table corresponding to said combined hash

indices (ROS 53, 55 and 57 in Figure 3A are data storage configured as a hash table referencing indexed data corresponding to said combined hash indices HF1-HF3).
The prior art however are not concerned with and do not teach, suggest, or otherwise render obvious a transforming step that include the steps of identifying said data vector as a border vector type, defining an offset of said data vector from a center of a decoding sphere of an error-correction code implemented by said inverse fault-tolerant decoder; and identifying all possible offsets from adjacent decoding spheres of said error-correction code until said combinations fill in all bit positions corresponding to said data vector such that centers of said adjacent decoding spheres correspond to said index values as taught by claim 13. Hence the prior art taken alone or in any combination fail to teach the claimed novel feature in claim 13.
Claims 6 and 19 recite substantially the same language as in claim 13 when combined with their respective base claims.

Claim 14 recites various features:
"(i) identifying said data vector as a non-border vector type, (ii) identifying an offset vector of said data vector from a center of a central index decoding sphere representing a specified offset distance, (iii) identifying centers of adjacent decoding spheres within said specified offset distance of said data vector, and (iv) combining said centers of said adjacent decoding spheres with said center of said central index decoding sphere to form pairs of indexes".

The prior art however are not concerned with and do not teach, suggest, or otherwise render obvious a transforming step that include the steps of identifying said data vector as a non-border vector type; identifying an offset vector of said data vector from a center of a central index decoding sphere representing a specified offset distance; identifying centers of adjacent decoding spheres within said specified offset distance of said data vector; and combining said centers of said adjacent decoding spheres with said center of said central index decoding sphere to form pairs of indexes as taught by claim 14. Hence the prior art taken alone or in any combination fail to teach the claimed novel feature in claim 14.

Claims 7 and 20 recite substantially the same language as in claim 14 when combined with their respective base claims.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (703) 308-7066. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (703) 305-9595. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joseph D. Torres, PhD
Art Unit 2133